

GOSHEN (LOWER NORTH PLATTE) WETLANDS COMPLEX

Regional Wetlands Conservation Plan



Goshen Wetlands Working Group
Wyoming Bird Habitat Conservation Partnership

Version 1.1

May 21, 2014

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ACRONYMS AND ABBREVIATIONS

ACEP.....	Agricultural Conservation Easement Program
ALE.....	Agricultural Land Easement (replaces GRP, FRPP under the ACEP)
BLM.....	U.S Bureau of Land Management
BMP.....	Best Management Practice
BOC.....	Board of Control (State Engineer's Office)
CRP.....	Conservation Reserve Program
CWA.....	Federal Clean Water Act of 1972
DEQ.....	WY Department of Environmental Quality
DEQ/WQD.....	DEQ Water Quality Division
DU.....	Ducks Unlimited
EPA.....	U.S. Environmental Protection Agency
EQIP.....	Environmental Quality Incentives Program
IWJV.....	Intermountain West Joint Venture
LWCF.....	Land and Water Conservation Fund
NAWCA.....	North American Wetland Conservation Act
NGO.....	Nongovernmental Organization
NGPJV.....	Northern Great Plains Joint Venture
NPS.....	Nonpoint Source
NRCS.....	Natural Resources Conservation Service
PFW.....	Partners for Fish and Wildlife
PIF.....	Partners in Flight
SCORP.....	Statewide Comprehensive Outdoor Recreation Plan
SEO.....	WY State Engineer's Office
SGCN.....	Species of Greatest Conservation Need
SWANCC.....	Solid Waste Agency of Northern Crook County, Illinois
SWAP.....	State Wildlife Action Plan
SWG.....	State Wildlife Grants
TNC.....	The Nature Conservancy
USACE or COE.....	U.S. Army Corps of Engineers
USDA.....	U.S. Department of Agriculture
USFWS.....	U.S. Fish and Wildlife Service
USGS.....	U.S. Geological Survey
UW.....	University of Wyoming
WGFD.....	Wyoming Game and Fish Department
WHIP.....	Wildlife Habitat Incentives Program
WHMA.....	Wildlife Habitat Management Area
WRE.....	Wetland Reserve Easement (replaces WRP under the ACEP)
WRP.....	Wetlands Reserve Program
WWNRT.....	Wyoming Wildlife and Natural Resource Trust Account
WY.....	Wyoming

INTRODUCTION

The Goshen Wetlands Complex encompasses the N. Platte River corridor, lower Rawhide Creek, and a low-lying basin known as Goshen Hole in central Goshen County, southeast Wyoming (Fig. 1). The region is an important migration corridor and stopover habitat for waterfowl, waterbirds, and numerous other avian species. Cerovski et al. (2004) documented breeding by 13 species of ducks and 19 species of waterbirds and shorebirds. At least 46 vertebrate species of greatest conservation need use the wetlands, riparian and riverine habitats of Goshen Hole (WGFD 2010). The Goshen Complex also received one of the highest species diversity rankings in a wetland assessment study recently completed by The Nature Conservancy (Copeland et al. 2010). For these reasons, the Goshen Wetlands Complex has been identified as one of 9 priority complexes in Wyoming that warrant increased conservation emphasis (WY Joint Ventures Steering Committee 2010). The Goshen Complex is also the State's most important waterfowl hunting location in terms of hunters, total harvest, and recreation days. The region has very high recreation value due to its proximity to the State's major population centers including cities of Cheyenne, Laramie, Wheatland, and Torrington. Several agencies and organizations are involved in ongoing wetland and riparian habitat conservation activities within the Goshen Complex. These efforts include wetland construction and enhancement, outreach and technical assistance, easement purchases, and conservation incentives. The purposes of this regional plan are to describe the landscape and wetland resources of Goshen Hole, identify conservation partners, and outline specific wetlands conservation objectives and strategies.

GENERAL DESCRIPTION AND LAND USE

The exterior boundary of the Goshen Wetland Complex encompasses 491 mi². Goshen Hole is among the lowest elevations of Wyoming, ranging from 4,000-4,600 ft above sea level. Topography is level to gently rolling, bounded by escarpments (Goshen Rim) rising approximately 500 ft on the south and west sides. Average annual rainfall is 14-16 inches and the average growing season is 121-140 days (Curtis and Grimes 2004). Soils originate predominantly from sand and clay outwash or "pediments" transported by prevailing winds and surface runoff from the escarpments (e.g., Bear Mountain and Sixty-six Mountain) on the south and west (Adams 1902, Rapp et al. 1957). The Goshen Wetlands Complex also includes the alluvial floodplain of the lower North Platte River from the Wyoming-Nebraska state line upstream to the Goshen-Platte county line.

The dominant land use is agriculture, predominantly consisting of irrigated and non-irrigated crops and native rangeland. Based on the 2002 agricultural census approximately 88% of Goshen County is in farm ownership (USDA National Agricultural Statistics Service). Lands classified as cropland, encompass 20% of the county area, but harvested crops are grown on less than half (42%) of the cropland. About a third of the available cropland is irrigated. Livestock forage (hay, grass) is the dominant crop, accounting for 37% of the total harvested cropland. Wheat and corn account for 26% and 25% respectively. The remaining 12% is comprised of dry

edible beans, sugar beets, oats, barley, and sunflowers. Substantial acreages are enrolled in the Conservation Reserve Program (CRP). As of June, 2013, 73,312 acres were enrolled in active CRP contracts in Goshen County (Source: USDA Farm Service Agency – CRP County by County Summary report: http://www.fsa.usda.gov/Internet/FSA_File/su45county0813.pdf). An additional 106 acres were enrolled in the Wetland Reserve Program (WRP).

Ecological Cover Types

Herbaceous planted and cultivated fields are the dominant ecological cover type in the Goshen Hole region (Comer et al. 2003). Natural cover types include remnants of Northwestern Great Plains Mixedgrass Prairie and stringers of Western Great Plains Riparian/Floodplain.

Undisturbed sites in good condition are dominated by fescues (*festuca spp.*), western wheatgrass (*Pascopyrum smithii*), and needlegrass (*Nassella spp.*). Shrub components include snowberry (*Symphoricarpos spp.*), fringed (prairie) sagewort (*Artemisia frigida*), and sand sage (*Artemisia fillifolia*). Cottonwood (*Populus deltoides*) and willow (*Salix spp.*) dominate wooded areas along the larger streams and the North Platte River. Native species within the riparian understory include Switchgrass (*Panicum virgatum*) and big bluestem (*Andropogon gerardii*). Cheatgrass (*Bromus tectorum*), Russian thistle (*Salsola spp.*), and annual forbs typically invade upland sites that are disturbed or in poor condition. Salt cedar (*Tamarix spp.*), Russian olive (*Elaeagnus angustifolia*), Canada thistle (*Cirsium arvense*), and smooth brome (*Bromus inermis*) often dominate in degraded riparian sites.

Hydrology

Horse Creek is the principal watershed draining most of Goshen Hole. This perennial stream originates in the southern foothills of the Laramie Mountain Range and flows generally north and east, joining the North Platte River approximately 5 mi east of the Wyoming-Nebraska line. Bear Creek and Fox Creek are major tributaries with watersheds extending south and west of the Goshen Wetland Complex. Other tributaries include Dry Creek, Cherry Creek, Corn Creek, Lone Tree and Box Elder Creek, all intermittent prairie streams. The average annual discharge of Horse Creek at Lyman, Nebraska near the Wyoming State Line is 54,200 acre-ft based on stream gauging records since 1931. (Source: USGS/Neb. Dept. Nat. Res. flow records available at: <http://dnrdata.dnr.ne.gov/Canal/Stream/Monthly.asp?ids=06677500>). Annual discharges have exceeded 40,000 acre-ft during 75% of the years of record. Peak average monthly discharges of 9,608 and 9,751 acre-ft occur during June and September, respectively. January is the low discharge month, averaging 1,547 acre-ft. Flows in Horse Creek are heavily influenced by irrigation withdrawals and return flows during summer months.

Wetlands and Other Water Resources

Prior to settlement, the wetlands of Goshen Hole were predominantly scattered springs and seeps, intermittent pools and oxbows along prairie streams, and isolated playas formed by wind action. Rapp et al. (1957) described the surface in many places as mantled with slope-wash material, which is pockmarked by windblown depressions. Since the beginning of the 20th century, human activities have both eliminated and created wetlands in the region. Overall, the number of semi-permanent and permanent palustrine wetlands has likely increased due to the influence of irrigation projects, reservoirs, and habitat areas developed through various federal and state programs (Fig. 1).

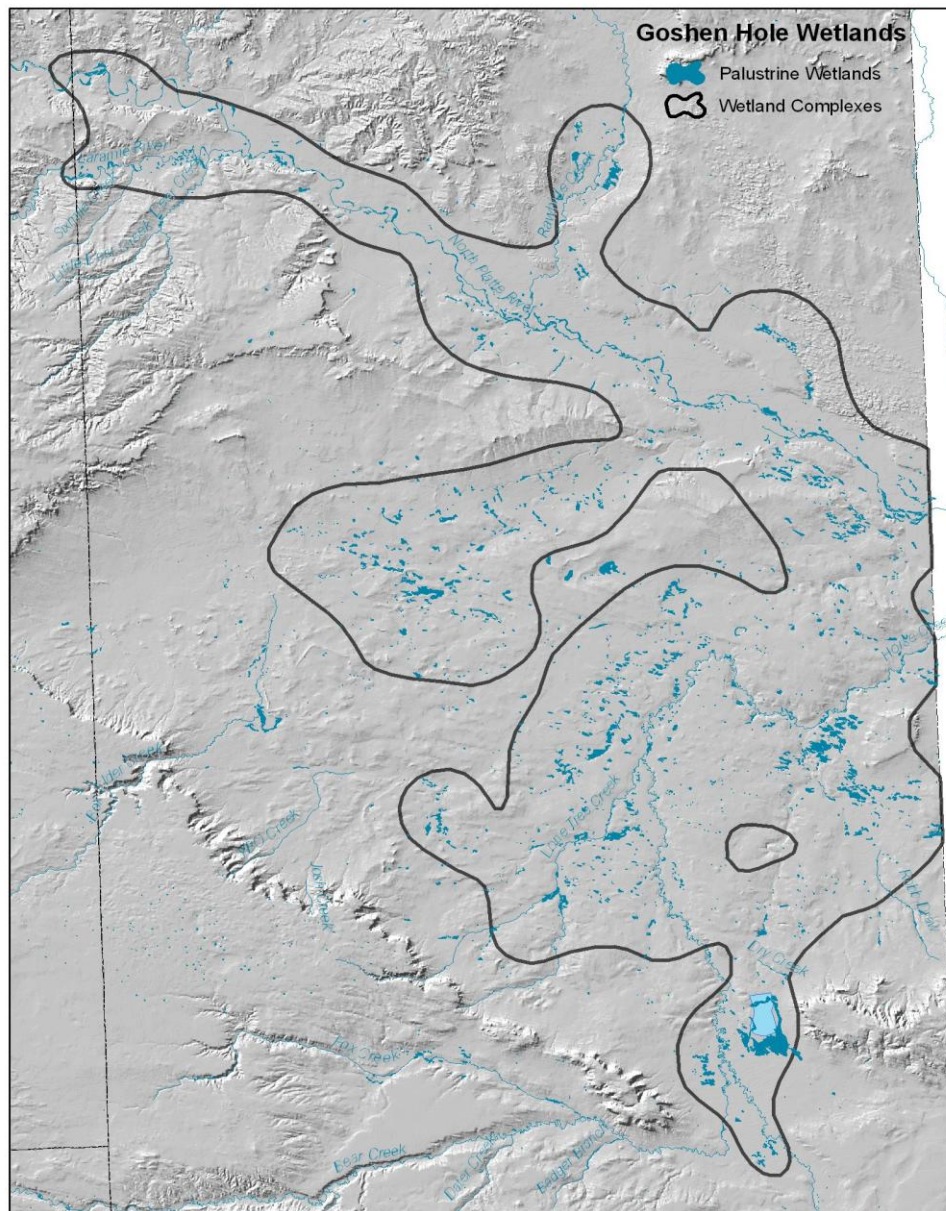


Fig. 1. Goshen Wetland Complex (Copeland et al. 2010).

The irrigation canals and ditch systems were largely completed in the early 1900s (Fig. 2). The Fort Laramie Canal, which diverts flow from the North Platte River into the northern portions of Goshen Hole, was completed in 1929. The central and southern portions of Goshen Hole are irrigated by diversions from Horse Creek and its tributaries. The Horse Creek Diversion was completed in 1923. Hawk Springs Reservoir is the largest storage facility with a surface area of 1,280 acres and capacity of 16,735 acre-ft. Surface areas and capacities of the larger reservoirs in Goshen Hole are summarized in Table 1.

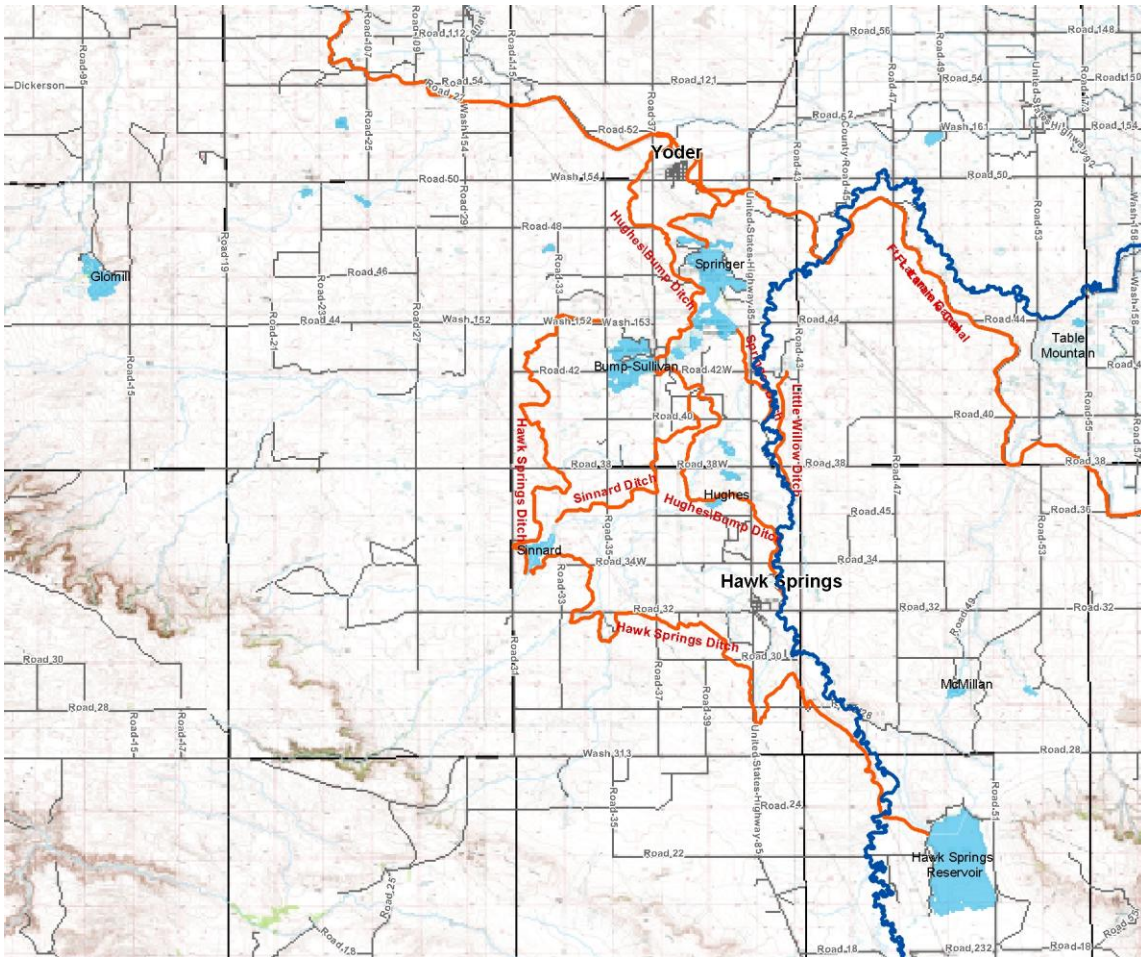


Fig. 2. Horse Creek irrigation system and eastern segment of the Fort Laramie Canal.

Wetlands associated with irrigation include margins of storage reservoirs, seepage areas along canals and ditches, and natural or constructed basins that capture return flows from flood-irrigated fields and pastures. In some cases, irrigation runoff augments flows within streams that were historically dry by mid-summer, thereby extending the flow period and sustaining enhanced wetland hydrology. Wetlands that existed prior to 1980 are reflected in the National Wetland Inventory (NWI) database for Goshen County. However, wetlands built since then are not in the NWI database.

Numerous wetlands have been built or enhanced on Wildlife Habitat Management Areas (WHMAs) owned by the Wyoming Game and Fish Commission, and on private lands in conjunction with Farm Bill programs administered through the Natural Resource Conservation Service (NRCS), and the Partners for Fish and Wildlife Program administered through the U.S. Fish and Wildlife Service (USFWS). Ducks Unlimited (DU) has also designed, built, and funded several wetland projects, both on WHMAs and private lands in Goshen Hole.

The composition of palustrine wetlands within the Goshen Complex is summarized in Table 2. This summary is based on 1980 imagery and does not include wetlands constructed on private lands after 1980. Since 2000, roughly 400 acres of wetland habitat and more than 1,000 acres of upland habitat have been restored through the efforts of partners including DU, NRCS, and Wyoming Game and Fish Department (Mark Hogan, *pers. comm.*).

Table 1. Large reservoirs in the Goshen Complex.

Facility Name	Surface Area (at capacity)	Capacity	Uses
Hawk Springs Reservoir	1,280 acres	16,735 acre-ft	irrigation storage, fisheries, waterfowl refuge, recreation
Springer (Goshen Hole) Reservoir	681 acres	5,183 acre-ft	irrigation storage, fisheries, waterfowl refuge, recreation
Bump-Sullivan (Goshen Nos. 1&2) Reservoir	150 acres	1,929 acre-ft	irrigation storage, fisheries, waterfowl hunting, recreation
Glomill (Miller) Reservoir	260 acres	1,561 acre-ft	private lake, irrigation storage, fisheries, waterfowl hunting
Sinnard Reservoir	100 acres	1,540 acre-ft	private lake, irrigation storage, fisheries, waterfowl hunting
Packer Lake	80 acres	255 acre-ft	irrigation storage, fisheries, waterfowl hunting, recreation

Table 2. Composition of palustrine wetlands within the Goshen Complex based on 1980 imagery (from Copeland et al. 2010).

Wetland Type	Number	Total area
Temporary palustrine	2,118	5,443 acres
Semi-permanent palustrine	671	1,694 acres
Permanent palustrine	2	12.4 acres
TOTALS	2,791	7,149 acres

Managed Wetlands and Riparian Habitats

The Department manages 3 Wildlife Habitat Management Areas (WHMAs) within the Goshen Wetland Complex. Extensive wetland areas have been built on Springer and Table Mountain WHMAs. Rawhide WHMA encompasses a 6-mile riparian tract along the North Platte River between Torrington and Lingle.

Springer WHMA. The Springer WHMA is located 15 miles south of Torrington. Springer was acquired in 1948 to establish a waterfowl refuge and provide upland habitat and pheasant hunting opportunities. The existing WHMA encompasses 2,413 acres including 1,331 acres under fee title ownership, 600 acres managed by the U.S. Bureau of Land Management, and 482 acres of easements across private property. (Lands under BLM ownership are in the process of being transferred to the Wyoming Game and Fish Commission). Two reservoirs, Springer and Bump-Sullivan, serve as both waterfowl habitat and storage for irrigation (Table 1). Extensive wetlands have been built on the area since the mid 1970s, including several that were established as mitigation for the Cheyenne Stage II Water Project. At least 8 diked wetland basins cover approximately 160 acres. Ducks Unlimited was a partner in the construction of several wetlands known as the “Welnitz ponds.” Numerous species of waterfowl and shorebirds nest on the Springer WHMA or rest, feed and stage there during migration. Springer Reservoir becomes a refuge for a population of wintering Canada geese after it is closed to waterfowl hunting in mid-November each year.

Table Mountain WHMA. The Table Mountain WHMA is located 15 miles southeast of Torrington. Table Mountain was acquired in 1962 to provide year round habitat for waterfowl and upland game birds, and public hunting opportunity. The existing WHMA encompasses 1,736 acres including 175 acres under fee title ownership and 1,561 acres managed by the U.S. Bureau of Land Management. (Lands under BLM ownership are in the process of being transferred to the Wyoming Game and Fish Commission). The WHMA contains 189 acres of ponds and 245 acres of wetlands consisting of at least 11 basins. Several wetlands were constructed in a cooperative project with Ducks Unlimited. A variety of waterfowl and shorebirds nest on this WHMA and many additional species rest, feed, and stage there during migration. A portion of Table Mountain (Pond 1) is closed to hunting after mid-November to provide a secure rest area used by several thousand wintering Canada geese and mallard ducks.

Rawhide WHMA. The Rawhide WHMA is located along the North Platte River 2 miles south of Lingle. Lands comprising the WHMA were originally acquired in the late 1970s to mitigate riparian habitat inundated by construction of Grayrocks Reservoir on the Laramie River. The Rawhide WHMA encompasses 807 acres under fee title ownership and 11 acres of access easements. The major purposes of this WHMA are to conserve native riparian habitat and associated wildlife, and to provide hunting, fishing, and wildlife viewing opportunities for the public. Over 6 miles of river and the confluence of Rawhide Creek provide year round habitat for waterfowl, upland game birds, and a variety of nongame birds. Wetlands include shallow

backwaters along the North Platte River and several oxbows off the main channel. This stretch of river is an important corridor and rest area for ducks and geese that migrate through SE Wyoming, and it provides open water for wintering waterfowl. The lower North Platte River is also an important migration corridor for shorebirds and neotropical migratory birds.

Waterfowl Refuges. Historically, the Department established several waterfowl hunting closures within the Goshen Wetland Complex to create security areas for ducks and geese. Most have persisted to the present day. Hawk Springs Reservoir has been closed to waterfowl hunting since at least 1949; Springer Reservoir since 1950; Table Mountain Pond No. 1 since 1964; Miller (Glomill) Lake since 1965; and the North Platte River between the 2 crossings of Hwy 157 (upstream from the Rawhide WHMA) since 1979. Sinnard Reservoir was closed beginning in 1963, but the closure was removed in 1999 at the landowner's request.

Private Lands Program. The U.S. Fish and Wildlife Service (USFWS) and Natural Resources Conservation Service (NRCS) have supported wetland projects on private lands through several cost share programs. These include the Wetlands Reserve Program (WRP), Partners for Fish and Wildlife (PFW), and Wildlife Habitat Incentives Program (WHIP) among others. Approximately 4,000 acres of private lands in the Goshen Hole area are currently enrolled in management agreements with 50 individual cooperators (Fig. 3). Roughly 30% (1,200 acres) of this area is wetland and the remainder is upland buffers. The hydrology of most constructed wetlands on private lands (about 85%) depends on irrigation runoff or enhanced groundwater table.

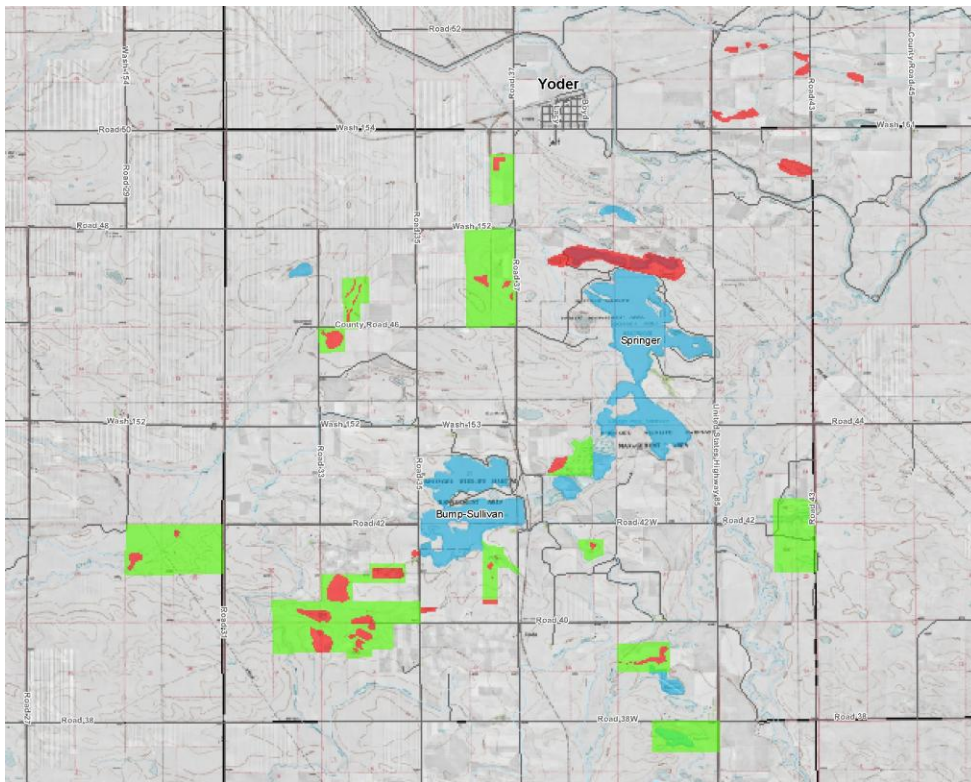


Fig. 3. Lands under USFWS Partners' program agreements in Goshen Hole.

WETLAND-ASSOCIATED WILDLIFE

Goshen Hole contains habitat for the Preble's meadow jumping mouse (*Zapus hudsonius preblui*), currently listed as "threatened," and wet meadow habitat for the threatened Ute's Ladies'-tresses (*Spiranthes diluvialis*) (Mark Hogan, *pers. comm.*). The USFWS Partners for Fish and Wildlife program has focused on restoring wetlands and adjacent shortgrass upland habitats for an assortment of ground nesting species including Mountain plovers (*Charadrius montanus*), McCown's longspur (*Rhynchophanes mccownii*), Bobolinks (*Dolichonyx oryzivorus*) and a variety of waterbirds. The Wyoming State Wildlife Action Plan (WGFD 2010) identifies 46 vertebrate species of greatest conservation need (SGCN) that utilize wetland, riparian, and stream habitats in the Goshen Hole area (Table 3).

The Wyoming Game and Fish Department conducted duck breeding pair surveys from the early 1950s through 1999 based on a stratified random sample design consisting of 58 count blocks throughout the state. The Yoder count block (72 mi²) is located in the west central portion of the Goshen Hole Wetland Complex. Based on surveys conducted from 1970-1999, the average density of duck breeding pairs in the Yoder count block ranked 3rd in the state (13.6 indicated pairs per mi²), and 2nd when tallied for dabbling duck species (8.8 indicated pairs per mi²). Seventeen species of ducks have been documented in the area. The most common are mallard (*Anas platyrhynchos*), teal [blue-winged (*Anas discors*), green-winged (*Anas carolinensis*), and cinnamon (*Anas cyanoptera*) combined], northern pintail (*Anas acuta*), gadwall (*Anas strepera*), and northern shoveler (*Anas clypeata*) in decreasing order of abundance. The Department suspended breeding pair counts after 1999 due to budget constraints and because Wyoming is not within the traditional survey area the USFWS uses to monitor continental breeding populations and habitat conditions.

Northern pintails are a species of concern nationally due to declining populations. Haukois et al. (2006) documented the Goshen Complex is an important spring stopover area used by pintails that winter along the Rio Grande River, New Mexico.

Over 200,000 Canada geese (*Branta canadensis*) from the Hi-Line and Short Grass Prairie populations migrate through Goshen Hole during the fall/winter period and a substantial number overwinter there in typical years. On average, 26,750 dark geese have been counted in the Goshen Hole region during mid-winter waterfowl surveys since 2001 (WGFD 2005, 2010). A high count of 53,855 was recorded in January, 2006. Over 30,000 ducks, mostly mallards, are also counted annually. Over 100,000 snow (*Chen caerulescens*) and Ross' (*Chen rossii*) geese stage in Goshen Hole during March through early April each year.

Table 3. Species of greatest conservation need that use wetland, riverine, or riparian habitats in the Goshen Complex.

<u>Birds</u>	<u>Mammals</u>	<u>Amphibians</u>
American Bittern (<i>Botaurus lentiginosus</i>)	Big Brown Bat (<i>Eptesicus fuscus</i>)	Northern Leopard Frog (<i>Lithobates pipiens</i>)
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Fringed Myotis (<i>Myotis thysanodes</i>)	Plains Spadefoot (<i>Spea bombifrons</i>)
Barrow's Goldeneye (<i>Bucephala islandica</i>)	Long-eared Myotis (<i>Myotis evotis</i>)	
Black-crowned Night-Heron (<i>Nycticorax nycticorax</i>)	Long-legged Myotis (<i>Myotis volans</i>)	
Black Tern (<i>Chlidonias niger</i>)	Little Brown Myotis (<i>Myotis lucifugus</i>)	
Canvasback (<i>Aythya valisineria</i>)	Meadow Jumping Mouse (<i>Zapus hudsonius</i>)	<u>Fish</u>
Caspian Tern (<i>Hydropogon caspia</i>)	Northern Myotis (<i>Myotis septentrionalis</i>)	Bigmouth Shiner (<i>Notropis dorsalis</i>)
Clark's Grebe (<i>Aechmophorus clarkia</i>)	Pallid Bat (<i>Antrozous pallidus</i>)	Brassy Minnow (<i>Hybognathus hankinsoni</i>)
Forster's Tern (<i>Sterna forsteri</i>)	Preble's Meadow Jumping Mouse (<i>Zapus hudsonius preblei</i>)	Central Stoneroller (<i>Camptostoma anomalum</i>)
Franklin's Gull (<i>Leucophaeus pipixcan</i>)	Townsend's Big-eared Bat (<i>Corynorhinus townsendii</i>)	Common Shiner (<i>Luxilus cornutus</i>)
Lesser Scaup (<i>Aythya affinis</i>)	Vagrant Shrew (<i>Sorex vagrans</i>)	Hornyhead Chub (<i>Nocomis biguttatus</i>)
Redhead (<i>Aythya americana</i>)		Iowa darter (<i>Etheostoma exile</i>)
Snowy Egret (<i>Egretta thula</i>)		Orangethroat darter (<i>Etheostoma spectabile</i>)
Swainson's Hawk (<i>Buteo swainsoni</i>)		Plains killifish (<i>Fundulus zebrinus</i>)
Virginia Rail (<i>Rallus limicola</i>)		Plains Topminnow (<i>Fundulus sciadicus</i>)
White-faced Ibis (<i>Plegadis chihi</i>)		Suckermouth Minnow (<i>Phenacobius mirabilis</i>)
Willow Flycatcher (<i>Epidonax traillii</i>)		
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)		
	<u>Reptiles</u>	
	Plains Garter Snake (<i>Thamnophis radix</i>)	
	Red-sided Garter Snake (<i>Thamnophis sirtalis parietalis</i>)	
	Smooth Green Snake (<i>Opheodrys vernalis</i>)	
	Western Painted Turtle (<i>Chrysemys picta belli</i>)	
	Western Spiny Softshell (<i>Apalone spinifera hartwegi</i>)	

OTHER PLANS AND INITIATIVES IN GOSHEN COUNTY

Ducks Unlimited's Platte River/Rainwater Basin Initiative

<http://www.ducks.org/conservation/platte-river-and-rainwater-basin/platte-river-and-rainwater-basin-initiative>

The Goshen Wetland Complex is within Ducks Unlimited's Platte River Initiative. The initiative's focus area has enormous importance to migrating waterfowl and shorebirds, and is part of DU's Southern Great Plains priority area. DU is completing a business plan for SE Wyoming that will outline the work they expect to accomplish in the upcoming 5 years.

DU has restored nearly 1,200 acres of wetlands and associated uplands in Goshen County. Although DU is capable of holding conservation easements through its land trust, Wetlands America Trust, none have been completed in Wyoming. For many years, DU's programmatic focus has been to provide technical assistance to landowners and agencies, and in some cases funds to restore wetlands. Now, the program is highly focused on the Platte River with 90% of resources expended in Goshen County. DU will complete 3 easements for an additional 328 acres perpetually protected.

Focus on a specific landscape has already had an incredible impact on wetland conservation in the area. Through 2006, DU spent about \$1.1 million in Wyoming, mostly from DU funds. From 2007 through the end of 2010, DU projected an expenditure of more than \$1.7 million for wetlands conservation. Success depends on diverse partnerships with local landowners, state agencies, and other conservation organizations with a focused mission. The program also depends on DU to deliver projects with dedicated staff rather than disbursing funds to other organizations as in the past.

Water quantity and quality are crucial to the future of wetlands. DU will work with the state and other organizations to assure water is available for wildlife through wetlands. In 2009, DU was awarded a grant from the WGFD Habitat Trust Fund to identify additional sources of water for wetland restoration, management and maintenance at Table Mountain and Springer WHMAs. A final report was released in 2012. The report analyzed 12 alternatives, concluding that 3-4 options have potential to substantively improve water availability and management on the WHMAs (AVI 2012). Over the next several years, the WGFD will partner with DU to pursue implementation of options that are most likely to be successful.

DU anticipates wetland restoration programs will grow in the county as news of successful projects proliferates through local talk. DU's goal through 2015 is to triple their success since 2007 and secure a standard North American Wetlands Conservation Act (NAWCA) grant that will dedicate \$1 million in federal funds.

USFWS Partners for Fish and Wildlife Program

The U.S. Fish and Wildlife Service's Partners Program was established in 1987 to promote on-the-ground wetland restoration projects on private lands. The Wyoming program description can be downloaded from: <http://www.fws.gov/mountain-prairie/pfw/wy/>.

The Partners Program has identified 9 focus areas where the majority of staff time is expended to implement wetlands and upland habitat conservation projects in Wyoming (USFWS 2012). The focus areas include Wind River, Goshen Hole, Bear River, Laramie Plains, Upper Green River, Upper Sweetwater/Red Desert, Powder/Tongue River, Laramie Plains, and Black Hills Mixed Grass focus area. Up to the time this plan was published, Partners staff expended approximately 70% of their time in two staffed focus areas – Wind River and Goshen Hole. The remaining 30% was allocated among the other 6 focus areas. With relocation of Partners staff from Goshen Hole to the Laramie Plains area, and assignment of additional staff to the Bear River area, the balance of staff time has shifted more to those areas.

PFW has established 5-year targets for each focus area. Statewide goals are to restore/enhance: 1,125 acres of wetlands; 121,700 acres of upland habitat; 119 miles of riparian habitat; and 98 miles of in-stream habitat. In recent years, focus of the Partner's Program has shifted away from Goshen Hole. Five-year targets are to restore/enhance 30 acres of wetlands, 200 acres of uplands, and 1.0 miles of riparian/stream.

Intermountain West Joint Venture (IWJV)

Coordinated Implementation Plan for Bird Conservation in Central and Western Wyoming (BCRs 10, 16, 18)

The major purpose of the Wyoming Implementation Plan is to assist the IWJV Management Board in reviewing and ranking various habitat protection, restoration and enhancement projects for funding through the North American Wetlands Conservation Act (NAWCA) and other programs. The Wyoming Implementation Plan can be downloaded from: <http://www.iwjk.org/Images/WYPlan2005.pdf>. The Goshen Hole Wetland Complex is one of 48 priority bird habitat conservation areas identified in the plan. The plan does not provide Specific conservation goals for Goshen Hole and other individual conservation areas. Instead, goals are listed at the statewide level.

As of this publication, NAWCA funding for wetland conservation within the Goshen Complex has included a \$75,000 small grant (Wyoming North Platte Wetlands Initiative) awarded to Ducks Unlimited in 2008 to restore and enhance degraded seasonal wetlands, intermittent streams and warm-water sloughs in the Goshen area. DU also received two multi-state, NAWCA Standard U.S. grants of \$1 million each (Platte River Confluence Phase I and Platte River Wetlands Partnership II). The grant area involves the South and North Platte River confluence region predominantly within the Playa Lakes Joint Venture, but also includes Goshen County,

WY. The two standard grants have provided some additional funding used for wetlands work in Goshen CO.

[http://www.fws.gov/birdhabitat/Grants/NAWCA/Standard/US/Wyoming_Std.shtm]

Wyoming Partners in Flight (PIF): Wyoming Bird Conservation Plan: Version 2.0

Major purposes of the Wyoming Bird Conservation Plan are to identify priority species and habitats and to establish objectives for bird populations and habitats in Wyoming. The Goshen Hole Wetland Complex is within Bird Conservation Region 18 (Shortgrass Prairie). The plan describes conceptual objectives at statewide and landscape scales. However, goals and strategies are not stepped down to regional and local levels. A number of wetland best management practices are described in the plan and could improve wetland conditions for priority species if implemented within the Goshen Hole Complex. The Wyoming Bird Conservation Plan can be accessed at: <http://www.blm.gov/wildlife/plan/WY/menu.htm>.

The wetland component can be downloaded from:

<http://www.blm.gov/wildlife/plan/WY/Wetlands.htm#wetlands>.

Wyoming 2010 State Wildlife Action Plan

The State Wildlife Action Plan (SWAP) is a long-range plan to conserve Wyoming's Species of Greatest Conservation Need (SGCN) and was developed to meet the requirements of the Congressionally-authorized State Wildlife Grants (SWG) Program. The plan identifies SGCN, key habitats, and conservation challenges statewide. Habitat quality or "intactness" was estimated using a modeling approach (Copeland et al. 2005, 2007) for the ecological systems (Comer et al. 2003) mapped within Wyoming. The Goshen Hole Wetland Complex received a comparatively low habitat quality or "condition" score. This is not unexpected because watershed has been extensively converted to cultivated cropland. Wetlands in Goshen Hole area are also considered highly vulnerable to development impacts. However, 18 of the 24 avian SGCN that utilize wetlands and riparian habitats are found within the Goshen Wetland Complex and 7 are known to breed there (WGFD 2010, Oakleaf et al. 1992). Eleven of the 17 mammalian SGCN that utilize wetlands have also been documented within the Goshen Complex. The Goshen Wetland Complex, including the Lower North Platte River, has been identified as a key habitat area based on presence of avian and mammalian SGCN (WGFD 2005:86, Oakleaf et al. 1996). The SWAP does not provide conservation objectives or actions specific to the Goshen Wetland Complex.

The 2010 State Wildlife Action Plan can be downloaded from:

<http://gf.state.wy.us/SWAP2010/Plan/index.asp>

The Nature Conservancy

The mission of The Nature Conservancy (TNC) is to preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they

need to survive. TNC does this primarily through acquisitions of lands and easements to protect important representative communities and habitats in their natural state.

TNC completed a statewide inventory of Wyoming wetlands funded through the EPA's Section 319 nonpoint source program (Copeland et al. 2010). A major objective of the TNC study was to provide a decision support system for determining where to focus habitat conservation, management, and enhancement efforts. Information from the study was also used to develop a wetland component for the 2010 State Wildlife Action Plan, which updated the 2005 Comprehensive Wildlife Conservation Strategy. Functional wetland complexes were identified based on several criteria including mean wetland patch size, mean wetland densities, and distance between wetlands. The protection status of wetlands was based on land status and special management designations such as wilderness areas, national parks, and conservation easements. Wetland condition was assessed using indices that included distances to potential sources of impairment such as roads, dams, and pipelines, surface water use, and contaminant records such as pesticide applications. However, site-specific data were not collected to assess the condition of individual wetlands. Future site conditions were modeled and "at risk" areas identified based on vulnerability to climate change, rural residential development, and oil and gas potential. The Goshen Wetland Complex ranked 4th in terms of species diversity, but received a comparatively low integrity score based primarily on land uses.

TNC has also been actively involved in landscape conservation within the Goshen Hole area. TNC recently acquired the Lone Tree Ranch, a 1,408-acre property consisting of native mixedgrass prairie and riparian habitats along Lone Tree Creek. A conservation easement has been placed on the property to protect it from future subdivision or conversion to other intensive land uses. The property has been sold into private ownership with the easement attached, allowing a traditional ranching operation to continue.

Wyoming Wildlife and Natural Resources Trust

In 2005, the Wyoming Legislature created the Wyoming Wildlife and Natural Resource Trust (WWNRT). The WWNRT is funded from interest earned on a permanent account, by donations, and by legislative appropriations. Its purpose is to enhance and conserve wildlife habitat and natural resource values throughout the state. Any project designed to improve wildlife habitat or natural resource values is eligible for funding. WWNRT funds can also be used to meet the non-federal match requirements of other funding programs including NAWCA grants, WHIP, and SWG.

The WWNRT funded a Goshen Basin Wetland Project in partnership with Ducks Unlimited in 2007. This project reestablished and created shallow-water wetlands in Goshen County, adding approximately 600 acres of prime breeding, nesting, and migration habitat. The WWNRT also funded the Goshen County Coordinated Resource Management Program in partnership with the

Goshen County Weed and Pest District. This is a coordinated effort to control invasive plant species and re-establish native grassland and wetland ecosystems.

WWNRT funds cannot be used for fee simple acquisition of real property or to purchase water rights. Information about the WWNRT and application procedures is available at:

<http://WWNRT.state.wy.us/>

Wyoming Statewide Comprehensive Outdoor Recreation Plan

The Statewide Comprehensive Outdoor Recreation Plan (SCORP) is prepared and updated every 5 years to maintain state eligibility for Land and Water Conservation Fund (LWCF) grants. Under LWCF guidelines, the SCORP document must include a wetlands component, which the Wyoming Game and Fish Department has prepared during each plan update. To our knowledge, no LWCF grants have been expended to acquire or enhance wetlands in Goshen County or the remainder of Wyoming. In 2009, the funding appropriation for the LWCF was increased substantially. The LWCF had been targeted to reach its nationwide funding level of \$900 million by 2014, but this is currently jeopardized by Congressional cutbacks in conservation programs. The potential to utilize LWCF funds for wetland acquisition and improvements to support wetland-based recreation needs to be further explored.

NORTH PLATTE RIVER DECREE AND RECOVERY IMPLEMENTATION PROGRAM

Two interstate legal agreements that affect water availability and use within the North Platte River system can impose significant constraints on wetlands projects within the Goshen Wetland Complex. They include the North Platte River Decree and the Platte River Recovery Implementation Program. Both agreements limit new depletions of flows within the North Platte River drainage.

North Platte River Decree

The North Platte River Decree of 1945, as modified in 2001, places a maximum cap on the amount of water that can be diverted from the North Platte River and its tributaries in Wyoming. Wyoming is allotted 25% of the river's natural flow between Guernsey Dam and Tri-State Dam (WY SEO 2006). Wyoming is not allowed to use more than 1,280,000 acre-feet above Pathfinder Dam and 890,000 acre-feet between Pathfinder and Guernsey Dam in any ten year period. Groundwater that is hydrologically-connected to the North Platte River is also covered by the decree. However, flows in Horse Creek, which drains Goshen Hole proper, are exempted from the decree.

Platte River Recovery Implementation Program

The Platte River Recovery Implementation Program, signed in 2006, was established through a cooperative agreement between the States of Wyoming, Nebraska, and Colorado. The purpose of the program is to provide Endangered Species Act (ESA) compliance for water users to minimize impacts on whooping crane (*Grus Americana*), piping plover (*Charadrius melodus*), interior least tern (*Sternula antillarum*) and pallid sturgeon (*Scaphirhynchus albus*). The program provides a streamlined consultation process under Section 7 of the ESA to address depletion-related impacts. The program area covers the entire North Platte River drainage in Wyoming and also includes the Horse Creek drainage in Goshen Hole. The USFWS has issued a guidance document regarding wetland activities and depletions in the Platte River Basin (USFWS 2008).

[<http://www.fws.gov/platteriver/Documents/platte%20wetland%20guidance%204Sep2008.pdf>]

A depletions analysis is required for all new or expanded water-related activities that commenced on or after July 1, 1997. If the water-related activity will result in increased depletions and is not covered by Wyoming's depletions plan, the project proponent may be required to develop a mitigation plan to offset the depletion. Project Proponents can also elect to complete independent Section 7 consultations rather than participate in the implementation program. Generally, mitigation is required for all new impoundments over two (2) acres at the high water line unless the inflow source is determined not to be hydrologically connected (WY SEO 2009). All new impoundments located in the alluvium of a river or stream will require mitigation for evaporation depletions regardless of size.

The U.S. Fish & Wildlife Service views wetland creation and enhancement projects as activities that potentially produce new or increased depletions of Platte River flows (USFWS 2008). However, the Service has determined restoration of wetlands that existed historically in the same location, and projects mitigating wetland losses at a nearby location, are not likely to adversely affect the federally-listed species covered by the N. Platte River Recovery Program. Therefore, such projects will not normally require depletion offsets under the Program.

Waters that are not hydrologically-connected to the North Platte River or its tributaries are exempted from the Recovery Implementation Program. "De minimis" uses resulting in less than 0.1 acre-ft/year of flow depletion are also exempted. The SEO has identified portions of the North Platte River and Horse Creek watersheds in which groundwater is not considered hydrologically-connected to the North Platte River and therefore need not be subjected to a depletions analysis. Maps of these "green areas" can be downloaded from: <http://seo.state.wy.us/maps.aspx> (WY SEO 2009). Surface waters emanating from springs within the green areas are also not considered hydrologically-connected to the North Platte River.

THREATS TO WETLANDS

Conditions that potentially threaten wetlands within the Goshen Complex, and the degree of risk they pose, are summarized in Table 4.

Table 4. Threats to wetlands in the Goshen Complex.

	Low	Moderate	High	Extreme
Climate Change/Drought				X
Conversions to Center Pivot Irrigation			X	
Irrigation Conveyance Improvements		X		
Insufficient water supplies to existing wetlands projects				X
Insufficient Resources to Manage/Maintain Existing Wetlands Projects			X	
Agricultural Practices Not Meeting BMPs		X		
Rural Subdivisions		X		
Weakened Regulatory Protections			X	
Invasive Species		X		
Disturbances Associated with Recreational Use	X			

Water Supplies

The water source for about 85% of human-created wetlands in the Goshen Hole Complex, including wetlands on the Game and Fish Commission's WHMAs, is derived directly or indirectly from irrigation. Although natural and constructed wetlands within the Goshen Complex were generally in good condition throughout the 1980s to mid 1990s, that timeframe coincided with several wetter than normal years. From 2000 through 2008, SE Wyoming was impacted by the most severe drought on record. Water supplies dwindled and wetlands sustained by irrigation flows ceased functioning in many cases. Springer Reservoir, Bump-Sullivan Reservoir, and all wetlands on the Springer WHMA were dry or nearly dry. Wetlands on the Table Mountain WHMA also remained predominantly dry, particularly during the summer nesting and brood rearing period. Water conditions recovered, at least temporarily, in 2009 and 2010. However, wetlands were dry for so long that many stands of emergent and submersed aquatic vegetation died out completely and will require years to recover.

Stream flows within the Horse Creek watershed are heavily appropriated. Approximately 40,000 acres of farmland are irrigated by diversions from Horse Creek and its 2 major tributaries – Bear Creek and Fox Creek (Gary Mehling *pers. comm.*). Adjudicated water rights in these 3 streams account for 1,125 ft³/second of cumulative diversions. (Cumulative diversions include reuse of return flows by downstream irrigators). Significant amounts of water also leak or evaporate from earthen canals and ditches. Up to 30-40% is lost in several lateral ditches within

the Horse Creek Irrigation District (WY Water Development Commission 1998) and cumulative losses can reach 75% before water is delivered onto some fields (Horse Creek Conservation District, *pers. comm.*). A study of the conveyance infrastructure identified 14 problem segments along supply ditches, of which 6 were recommended for repairs and improvements. However, funding has not been available to begin construction. When less water is available to flood-irrigate agricultural fields, the return flows that feed into several manmade wetlands are also diminished.

Center Pivot Conversions

Large-scale conversions from flood irrigation to center pivot sprinkler systems will likely reduce water supplies to a number of wetlands in the Goshen Hole area. Center pivot systems are a more efficient method of irrigating crops, but yield substantially less surface runoff into wetland basins. Federal funding assistance is available through the NRCS Environmental Quality Incentives Program (EQIP) to convert flood irrigation to center pivot systems. Although this is a water conservation program, its impact on wetlands has not been fully recognized or mitigated. At one time, wetlands on the Springer WHMA collected substantial return flows from adjacent flood-irrigated fields. The amount of runoff has decreased since several fields were converted to center pivot sprinkler systems.

Irrigation Delivery (Conveyance) Improvements

System upgrades to improve water delivery (e.g., installing canal linings or buried pipelines) will eliminate “seepage” wetlands along ditches and canals. Such impacts can be mitigated by constructing or enhancing other wetlands and this approach should be advocated in publicly funded rehabilitation projects. On the other hand, increasing water delivery may improve wetland management on Department WHMAs and could also yield greater irrigation return flows to other wetlands.

Inadequate Management/Maintenance of Existing Wetland Projects

To sustain natural or manmade wetlands in a productive condition, it is important to manage the watershed through appropriate farming, grazing, and erosion control practices and if necessary, active vegetation treatments. Wetland productivity can be further enhanced through a prescribed regime of water level manipulations. Engineered structures such as dikes and ditches also require periodic maintenance to be kept in a functioning condition. For many years, the resources needed to manage and maintain wetlands on Department habitat units were limited. In some cases, water control structures and fences lapsed into disrepair; dikes were damaged by erosion, rodent, and livestock activity; and personnel were not always available to monitor livestock distribution and attend to water management. This has been addressed through assignment of responsible personnel to oversee WHMAs throughout the state. However funding and other resource limitations will continue to be a challenge. Seasonal

shortages of water and withdrawals from multiple purpose reservoirs on some WHMAs can also constrain the Department's ability to implement favorable water management.

Agricultural Practices Not Meeting Best Management Practices

Although many wetlands in Goshen Hole were created and are maintained by irrigation, some agricultural activities can also adversely affect the quality and function of wetlands. For example, sediment washing from tilled fields and heavily grazed pastures can decrease the lifespan of wetlands and impair water quality. Water quality is also affected by agrichemical runoff including fertilizers, pesticides, herbicides, and animal wastes. Livestock grazing within wetland basins removes vegetation cover, damages root mats, and can accelerate shoreline and dike erosion. Appropriate best management practices have been developed to avoid or minimize many of these impacts. For example, maintaining a protected buffer of intact shoreline and emergent vegetation is the most effective means of filtering sediment and contaminant runoff, and protects shorelines from excessive wave action and erosion. Wetland vegetation also provides essential nesting and hiding cover as well as forage for wildlife. In some regions, isolated wetlands continue to be drained and converted to agricultural production, though this practice is not widespread in SE Wyoming. Best management practices that improve wetland quality and function, especially the retention of grassy buffers, should be encouraged.

Rural Subdivisions

Rural residential construction is beginning to appear in Goshen County. While not an immediate threat, this type of development is expected to increase in the foreseeable future. Some isolated wetlands may be eliminated by drainage or filling at construction sites. Roads, buildings, fences and disturbances such as increased traffic, human activity, mowing, and higher predator densities can adversely affect the suitability of nearby wetlands for many sensitive species. Loose pets, cats in particular, can be especially problematic for wetland dependent wildlife.

Compromised Regulatory Protections

Two U.S. Supreme Court decisions, *Solid Waste Agency of Northern Crook County (SWANCC)* in 2001 and *Rapanos and Carabell* in 2006, have modified the federal interpretation of "waters of the United States" subject to regulation by the U.S. Army Corps of Engineers (COE) and the Environmental Protection Agency (EPA). Wetlands lacking a "significant nexus" to navigable waters are no longer protected under the Clean Water Act (CWA). This revised interpretation has eliminated regulatory protections for many "isolated wetlands" such as playas, however the Swampbuster Provision of the Food Security Act continues to provide some incentive-based protection in agricultural regions. An operator who converts a wetland to crop production can lose eligibility for certain USDA program benefits including loans, subsidies, crop insurance, and

price support programs. However, Swampbuster has no bearing on non-agricultural activities that impact isolated wetlands. The SWANCC and Rapanos decisions have significant implications elsewhere, but their impact on Goshen Hole wetlands is expected to be moderate in the foreseeable future.

The EPA and COE are currently (in 2014) proposing revisions to clarify the definition of “Waters of the United States.” [79 FR 22188; 40 CFR Parts 110, 112, 116, 117, 122, 230, 232, 302, and 401 – <http://www.gpo.gov/fdsys/pkg/FR-2014-04-21/pdf/2014-07142.pdf>]. The proposed definition [FR 79:22188-22189] is:

“[w]aters of the United States” . . . mean: Traditional navigable waters; interstate waters, including interstate wetlands; the territorial seas; impoundments of traditional navigable waters, interstate waters, including interstate wetlands, the territorial seas, and tributaries, as defined, of such waters; tributaries, as defined, of traditional navigable waters, interstate waters, or the territorial seas; and adjacent waters, including adjacent wetlands.”

“The agencies emphasize that the categorical finding of jurisdiction for tributaries and adjacent waters was not based on the mere connection of a water body to downstream waters, but rather a determination that the nexus, alone or in combination with similarly situated waters in the region, is significant based on data, science, the CWA, and case law.”

“In addition, the agencies propose that ‘other waters’ (those not fitting in any of the above categories) could be determined to be ‘waters of the United States’ through a case-specific showing that, either alone or in combination with similarly situated ‘other waters’ in the region, they have a ‘significant nexus’ to a traditional navigable water, interstate water, or the territorial seas.”

Nonnative and Invasive Species

Spread of nonnative plants into wetlands, riparian zones, and adjacent watersheds often produce undesirable changes in habitat conditions. Problem species include tamarisk or salt cedar (*Tamarix spp.*), Russian olive (*Elaeagnus angustifolia*), cheatgrass (*Bromus tectorum*), smooth brome (*Bromus inermis*), leafy spurge (*Euphorbia esula*), Russian thistle (*Salsola kali*), halogeton (*Halogeton glomeratus*), field bindweed (*Convolvulus arvensis*) and others. These nonnative plants often outcompete desirable native plants and potentially create unsuitable habitat for endemic wildlife. Although some invasive trees and shrubs such as tamarisk and Russian olive can provide cover, nest sites, and forage, they also attract higher densities of predators, which adversely affect ground-nesting birds and small mammals adapted to open grassland ecosystems. Native vegetation should generally be emphasized when wetland projects are built. Invasive plants should be eradicated, where possible, and their further spread vigorously controlled. The Goshen County Weed and Pest District has actively controlled Russian olive and salt cedar with several projects funded through the WWNRT.

Recreational Use of Wetlands

Disturbance associated with human activity near wetlands can be a problem in densely populated or heavily used areas. In some portions of the state, recreational boating has become a significant source of disturbance impacting habitat effectiveness of wetlands along stream and lake margins. However, Goshen County is a predominantly rural landscape with a low human population density. For most of the year, disturbances associated with human activity remain at a very low level and are almost nonexistent on private wetland areas. Moderate to heavy hunting pressure on WHMAs can affect the distribution of migratory game birds and their use of wetlands for feeding and resting during the fall and early winter. The Department has established key area closures to serve as refuges for species that are sensitive to hunting pressure. As the human population continues to increase in SE Wyoming, recreational disturbance may become a larger problem in the future. On the other hand, allowing reasonable public access for wildlife-dependent recreation fosters a cultural appreciation for the value of wetlands and builds support for wetland conservation programs.

CONSERVATION OBJECTIVES

The following objectives are recommended to conserve and manage wetlands and riparian habitats within the Goshen Wetland Complex:

- 1) Build partnerships within the local community area to support wetland conservation efforts while maintaining traditional agricultural uses of the land.
- 2) Restore and improve water supplies to assure functional wetlands are sustained most years and to provide additional management options within existing wetland projects and on Commission-owned WHMAs. This is a top priority for the Goshen Wetland Complex, where susceptibility to climate change, drought impacts and water shortages has increased within the past few decades.
- 3) Work with conservation districts to improve the efficiency of irrigation delivery systems while mitigating impacts to irrigation-dependant wetlands such as seepage areas along canals.
- 4) Secure additional funding and match funding to support ongoing and future wetlands conservation and enhancement projects through DU, USFWS, NRCS, TNC, WWNRT, WGFD, and other partners.
- 5) Strive for no net loss of existing wetlands within the Goshen Hole Complex. Increase the wetland habitat base primarily through restoration of historically-drained and converted wetlands, and where sufficient water can be secured, through creation of additional wetlands.
- 6) Negotiate additional conservation easements and other instruments to protect important wetlands and riparian areas potentially vulnerable to future development.

- 7) Increase capacity to maintain and manage wetlands including those on Commission-owned WHMAs. Develop or implement plans to maintain wetlands in properly functioning condition, fulfill habitat requirements of target species, and optimize wetland productivity.
- 8) Provide additional public access opportunities for wetland-dependent recreation such as waterfowl hunting and wildlife viewing.
- 9) Implement wetland and watershed “best management practices” to improve water quality and sustain/enhance wetland functions and values throughout the Goshen Wetland Complex.
- 10) Increase the capacity of NRCS to deliver wetlands and riparian habitat conservation projects funded by Farm Bill Programs. Investigate the potential for interim management to develop habitat projects on CRP lands.

CONSERVATION STRATEGIES

Form a Watershed Management and Wetland Working Group

Additional human resources are needed to broaden wetland conservation efforts and should include participation from the local community area. A community-based network would connect interested citizens, landowners, and local/regional organizations with funding sources and technical expertise. Some obvious players in the Goshen Hole area are the landowner community, conservation districts, sportsmen and bird enthusiasts, local businesses, and organizations such as the Goshen County Two-Shot Goose Hunt, Goshen County Rooster Boosters, Goshen County Strutters (Wild Turkey Federation Chapter), and Goshen County Sportsmen’s Club. Other key partners include Ducks Unlimited, The Nature Conservancy, Intermountain West Joint Venture (IWJV), Wyoming Audubon, U.S. Fish and Wildlife Service Partners for Fish and Wildlife Program, Natural Resource Conservation Service, Goshen County Cooperative Extension Service (UW), Board of Control Division 1 (WY State Engineer’s Office), and Wyoming Game and Fish Department. The working group would meet periodically to:

- develop and reinforce partnerships;
- receive updates on wetland work planned or being done in the Goshen Hole area by all partners;
- provide a venue whereby landowners and irrigation districts with wetland conservation opportunities can connect with organizations, programs and funding sources to assist them;
- identify opportunities for improving functional integrity of existing wetlands by addressing water delivery, wetland maintenance and management, and other issues;
- identify opportunities and develop priorities for collaborative projects; and
- participate in strategic landscape planning at the local and regional levels;

Improve Water Supplies

Recurring drought and limited water supplies are the most significant and acute threat to wetlands in the Goshen Hole Complex. The quantity of water delivered to storage facilities, pastures, and cultivated fields has a direct bearing on hydrology of many if not most wetlands in the region. The following strategies are recommended to improve water supplies and delivery:

- Form a Goshen Hole Watershed Management and Wetlands Working Group comprised of a coordinator and members from the landowner community, agencies, and NGOs such as sportsman groups (see prior strategy).
- Support irrigation system rehabilitation and improvement projects that incorporate wetland conservation assurances.
 - Fabric liners will reduce seepage and increase delivery efficiency in irrigation ditches and canals, but will potentially cost several hundred thousand dollars per lineal mile.
 - Feasibility is probably limited to short, problem segments within the overall delivery system (WY Water Development Commission 1998).
 - Partial funding for system upgrades may be available from the Wyoming Water Development Commission.
 - Match funding is possibly available from NAWCA, State Wildlife Grants, Wildlife and Natural Resources Trust Account, and other sources if wetland conservation benefits can be demonstrated.
 - Wetlands sustained by seepage or leaks from irrigation ditches should be identified and wetland losses resulting from linings or other improvements should be mitigated in publicly funded projects.
 - If buried pipeline is installed, it should be limited to short segments of canal that address the most severe seepage problems. This is also the most efficient use of available funding.
 - Use of concrete to line canals is discouraged. Concrete lining is very expensive, frequently damaged by subsidence and frost heaving, and can result in significant loss of habitat. Concrete-lined canals also pose barriers to wildlife movements and can entrap some animals.
- Establish water-harvesting features such as windrows and shrub stands to accumulate snowdrifts. On wetland construction sites, grade surface contours to capture runoff and direct it into wetlands.
- Develop groundwater wells to augment surface water supplies into constructed wetlands.
 - Wells developed in the Lance Formation in south-central Goshen County can yield a maximum of 100 gpm (approximately 0.2 cfs) or potentially 0.4 acre-ft per day (Rapp et al. 1957).
 - Wells developed in the valley fill deposits along Horse Creek and Bear Creek yield up to 500-1,000 gpm (approximately 1-2 cfs) or 2-4 acre-ft per day (Rapp et al. 1957). However, wells in alluvial aquifers are generally treated as surface water diversions subject to surface water rights. Percolation from irrigated fields and seepage from

- canals are substantial sources of recharge to shallow aquifers and can enhance availability of groundwater in some locations.
- Groundwater use is subject to the same priority preference prescribed in law for surface water rights [Ref: W.S. 41-3-906].
 - Appropriations of groundwater for stock or domestic use of 25 gpm or less (.056 cfs) have preference over all other uses.
 - State water law imposes comparatively little restriction on drilling and pumping groundwater unless the well is drilled within a groundwater control area [Ref: W.S. 41-3-913] or unless it interferes with another well having a higher priority or with a surface water right. A well that interferes with another well used for domestic or stock watering purposes, or interferes with a well having a senior appropriation date, may be ordered to cease or reduce withdrawals [Ref: W.S. 41-3-911].
 - New wells in the Platte River Basin, including Goshen Hole, are subject to depletion analysis and mitigation requirements prescribed under the Platte River Recovery Implementation Program (USFWS 2008). However, wells drilled into groundwater aquifers that are not hydrologically-connected to the North Platte River are exempted (USFWS 2008; WY SEO 2009).
 - Deep wells drilled into the Fox Hills Formation are exempt from the Plate River Recovery Program. Potential water yield is up to 100 gpm (AVI 2012) and could potentially increase options for wetland management on a local basis (e.g., on Wildlife Habitat Management Areas).
- Maintain existing water rights in good standing on Commission-held lands.
 - An adjudicated water right must be exercised at least once in each 5-year period, when water is available, to protect it from abandonment proceedings [Ref: W.S. 41-3-401].
 - Lease or acquire property (from willing sellers) on which water rights can be managed to enhance wildlife habitats.
 - An irrigation water right is always attached to the land.
 - Except as otherwise provided, a water right for the direct use of the natural unstored flow of any stream cannot be detached from the land, place or purpose for which it was acquired [Ref: W.S. 41-3-101].
 - Return flows of water from irrigated crops and pastures (including habitat areas) can be captured within created wetland basins that are properly permitted through the WY State Engineer's Office.
 - If available, lease or purchase stored water (Hawk Springs Reservoir, Bump-Sullivan, Sinnard Reservoir, Glomill Reservoir, Springer Reservoir) to directly or indirectly enhance water supplies to wetlands [Ref: W.S. 41-3-320]. Stored water is owned by the Irrigation District and can be transferred or sold provided it is applied to the same or similar use(s) for which it was originally permitted, or if a change in use is approved by the Board of Control.
 - Investigate potential for temporary water transfers from other users to augment water supplies on Commission-owned and private wetlands [Ref: W.S. 41-3-110]. Such transfers may be approved for periods of up to 2 years.

- Investigate potential to fulfill existing water rights within permitted wetland impoundments at times of year (e.g. early spring/late summer) that are more beneficial for wetland management. This could potentially be achieved through water exchanges with other users [Ref: W.S. 41-3-106].
- File for “in-stream” flows to maintain native fish populations and sustain wetland habitats in smaller streams [Ref: W.S. 41-3-1001].
- Encourage formal recognition of “wildlife habitat” as a beneficial use in addition to the legislatively recognized use of “fisheries maintenance.”
 - “Beneficial use,” means that use by which the water supply of a drainage basin is depleted when usefully employed by the activities of man. Wildlife habitat qualifies as a beneficial use under this broad definition. However, the use of an adjudicated water right cannot be changed from another designated use to support wildlife habitat under current law.
 - Legislation patterned after the instream flow statute (W.S. 41-3-1001) could provide that water rights may be acquired and their use changed to support wildlife habitat (W.S. 41-3-1007).
- Network with partners including Conservation Districts, Joint Ventures, Ducks Unlimited, USFWS, NRCS, WY Water Development Commission, private landowners, and local/regional conservation organizations to identify and fund projects that will improve water delivery to wetlands within the Goshen Hole area.
- Investigate a range of potential funding sources to help improve water delivery systems, including North American Wetlands Conservation Act, Ducks Unlimited, Agricultural Conservation Easement Program (ACEP), Partners for Fish and Wildlife, Landowner Incentive Program, State Wildlife Grants, Wildlife and Natural Resources Trust, Wyoming Mineral Trust Fund, Water Development Account, energy mitigation funds, and others.

Note: The Agricultural Conservation Easement Program was established as part of the 2014 Farm Bill to combine the Wetland Reserve Program (WRP), Grassland Reserve Program (GRP) and Farm and Ranch Land Protection Program (FRPP) into a single, coordinated program. Ultimately, the ACEP will provide two conservation components – Agricultural Land Easements (ALEs) and Wetland Reserve Easements (WREs) – that combine the purposes and functions of the WRP, GRP and FRPP.

Build Additional Wetland Projects

The highest priority in Goshen Hole is to restore existing wetlands to their proper functioning condition by addressing water supply and land use issues. However, opportunities to build additional wetlands should be pursued in sites with secure and adequate water supplies. The USFWS Partners for Fish and Wildlife Program and NRCS have provided funding and technical assistance since the 1980s to construct wetlands on private lands in Goshen County. Ducks Unlimited has also been actively involved in wetland construction and conservation, on both Department-managed and private lands. Specific strategies include:

- Coordinate with Ducks Unlimited to identify and promote viable new wetland projects as part of the Platte River and Rainwater Basin initiative.
- Coordinate with the USFWS Partners for Fish and Wildlife Program and NRCS to identify and promote additional wetland projects on private lands.
- Support adequate Congressional appropriations to fund the Wetlands Reserve Program (now part of the ACEP – see above), Conservation Reserve Program, Wildlife Habitat Incentives Program, Partners for Fish and Wildlife Program, State Wildlife Grants, North American Wetlands Conservation Act, and the Land and Water Conservation Fund.
- Encourage wetland projects that increase public access for wetland-based recreation. Such projects can be constructed on accessible public lands, Commission-managed lands, or private lands under agreement, such as lands enrolled in the Department’s Private Lands / Public Wildlife Program. Providing additional opportunities for the public to use and enjoy wetlands will foster support for wetland conservation and restoration.

Establish conservation easements, where appropriate, to protect important and unique wetlands and riparian areas

Much of the riparian habitat along the North Platte River is vulnerable to subdivision in the Torrington and Lingle areas. Although the Department’s Rawhide WHMA currently protects a 6-mile corridor, areas upstream and downstream could potentially be developed. Other wetlands throughout Goshen Hole are protected to some degree by agricultural incentives programs (Swampbuster provision of the Food Security Act). Nearly all the wetland projects constructed under the USFWS private lands program are placed under conservation agreements ranging from 10-30 years in duration. It may be desirable to negotiate longer-term management agreements and to retain upland buffers surrounding some of the larger and more important projects in order to assure wetlands remain in proper functioning condition.

- Negotiate conservation easements to protect additional riparian habitats along segments of the North Platte River.
- Identify additional wetland/riparian habitats that are sufficiently unique or important within the Goshen Complex to warrant protection through long-term conservation easements.
- Negotiate longer-term conservation agreements to protect existing wetland projects and surrounding upland buffers on private lands, especially where existing agreements will expire.

Improve long-term management and maintenance of wetland projects

- New wetland projects should include an instrument assigning responsibility for long term maintenance, and assurance that adequate funding and other resources will be available to support management and maintenance. Wetland conservation easements should incorporate a similar maintenance agreement.

- Through agency extension and outreach programs, provide technical and financial assistance to implement wetland and watershed best management practices on private lands.
- Where appropriate, wetland projects should incorporate access control features such as fencing necessary to manage livestock distribution and public use.
- Detailed plans should be developed to maintain and manage wetlands on Department WHMAs. Plans should address:
 - Appropriate objectives such as food production, nesting/brood habitat, security areas, migration resting/staging areas, sensitive [SGCN] species, and public recreation;
 - Personnel and work units responsible for management and maintenance;
 - Prescriptive water level regimes to achieve management objectives;
 - Farming practices and moist soil management;
 - Wetland and upland vegetation treatments and noxious weed control;
 - Grazing management;
 - Inspection, maintenance, and repair of dikes and water control apparatus;
 - Public use and facilities maintenance;
 - Management activity schedules including periodic inspections;
 - A monitoring plan to assess progress toward management objectives; and
 - Funding, administrative, and environmental constraints to plan implementation, including how to address them.
- Adjust management regimes including water level manipulations and farming practices, as necessary to achieve management objectives and optimize productivity.

Apply wetland and watershed “best management practices.”

- Encourage landowners, agencies and organizations with stewardship responsibilities to implement wetland and watershed “best management practices” (BMPs).
- Provide technical support, assistance, and, where appropriate, funding to implement BMPs.
- Disseminate wetland and watershed BMP information through publications, bulletins, web sites, extension services, and one-on-one contacts.
- Some useful BMP and wetland design references include: Oneale (1993); Welsch et al. (1995); WY DEQ (1997, 1999, 2004); Brockmann (1999); Interagency Workgroup on Wetland Restoration (2003); Nicholoff (2003); McKinstry et al. (2004); Niemuth, et al. (2004); Tessmann (2004); and USEPA (2005).
- The Wyoming Department of Environmental Quality, Water Quality Division, also maintains a Watershed Management program. The following documents can be downloaded from <http://deg.state.wy.us/wqd/watershed/index.asp#Grants>:
 - Wyoming Nonpoint Source Management Plan Update
 - Hydrologic Modifications Best Management Practices
 - Grazing Best Management Practices
 - Cropland, Pasture/Hayland and Animal Waste Best Management Practices
 - Silviculture Best Management Practices

- Urban Best management Practices for Nonpoint Source Pollution
- Wyoming Statewide Wetland Mitigation Bank Guidelines for Interpretation and Implementation.

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